

What is claimed is:

1. A drive mechanism for raising or lowering a ramp attached to a minivan, said mechanism comprising:

5 a common shaft;

a gear, a cam, and a lever arm attached to said common shaft for rotation together about the common shaft;

wherein said lever arm is adapted to raise or lower the ramp as the lever arm rotates with said common shaft;

10 an electric motor coupled to said gear for causing said gear to rotate; and

energy storage means coupled to said cam for storing energy as said ramp is lowered and for releasing energy as said ramp is raised, said energy storage means operating  
15 independently of said motor for assisting in raising or lowering said ramp.

2. The drive mechanism as set forth in claim 1 wherein said energy storage means includes means for  
20 damping the motion of the ramp.

3. The drive mechanism as set forth in claim 1 wherein said energy storage means includes a spring.

25 4. The drive mechanism as set forth in claim 1 wherein said energy storage means includes a pneumatic cylinder.

5. The drive mechanism as set forth in claim 1  
30 wherein said motor is coupled to said gear through an electronically controlled clutch.

6. The drive mechanism as set forth in claim 5 wherein said clutch disengages when power to said clutch is  
35 interrupted.

11

*See 11/1/77*  
7. A minivan adapted for wheelchair access by a ramp attached to the minivan, said minivan comprising:

an electric motor mechanically coupled to the ramp for raising and lowering the ramp; and

5 energy storage means mechanically coupled to the ramp for reducing the force needed to raise or lower the ramp.

8. The minivan as set forth in claim 7 wherein said motor is coupled to said ramp by a gear driven lever arm  
10 and said energy storage means includes a spring coupled to said ramp by a cam attached to said lever arm and a plunger connecting said spring to said cam.

wherein said spring applies a lifting force to said lever arm to aid in raising or lowering said ramp.

15

9. The minivan as set forth in claim 7 wherein said energy storage means operates independently of said motor to reduce the force needed to raise or lower said ramp.